

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
FISHERIES DIVISION

**STATUS OF THE FISHERIES
IN MICHIGAN WATERS OF
LAKE ERIE AND LAKE ST. CLAIR
2000**



Bass tournament at Mt. Clemens Fisheries Research Station, July 2000

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Highlights for 2000

The purpose of this report is to provide an update on the status of the fisheries in the Great Lakes and connecting waters of southeast Michigan. Sources of information used in compiling this report include creel surveys, charter boat reports, an angler diary program, the Master Angler program, and commercial fishery records, as well as fisheries research studies. Some of the 2000 highlights described in detail include:

- Lake Erie yellow perch abundance has increased in recent years, whereas walleye abundance has declined. Walleye experienced below average reproduction in 1995 and 1998.
- Non-charter catch rates for Lake Erie walleye increased in 2000, while yellow perch catch rates declined. Angler effort increased in 2000, but was well below the levels observed prior to 1991.
- Charter boat catch rates for Lake Erie walleye were about three times higher than those estimated for non-charter anglers, while yellow perch catch rates were about two times higher.
- Entries in the Master Angler Program clearly indicate that Lake St. Clair is the premier Michigan water for trophy smallmouth bass and muskellunge.
- The exotic round goby has become a common food item for walleye in Lake St. Clair. Ruffe have not yet been collected from Lake St. Clair or Lake Erie.
- Long-term walleye tagging studies on Lake Erie illustrate the important contribution of Lake Erie walleye to the Great Lakes sport fishery of Southeast Michigan, from Port Huron to Toledo.
- Since 1996, a total of 904 lake sturgeon have been tagged and released in Lake St. Clair and the St. Clair River. To date, 25 tag recoveries have been reported.

Fishery Forecast for 2001

Annual variation in the reproductive success of walleye and yellow perch can result in substantial year to year changes in the abundance of these species. Harvestable-size yellow perch numbers will be higher in 2001 due to the full recruitment of the 1998 year class. Legal-size walleye numbers will remain about the same in 2001. Great lakes muskellunge and smallmouth bass numbers tend to remain more stable from year to year and both species should continue to provide excellent fishing opportunities in 2001. However, weather conditions can affect sport fishing success as much as fish abundance, and it is therefore difficult to predict fishing success. Water levels are expected to remain relatively low again this year, which may restrict angler access to some traditional fishing areas in the connecting waters. The success of marsh spawning species such as northern pike and largemouth bass could be negatively influenced.

Sport Fishery Summary

An on-site creel survey conducted by the Michigan Department of Natural Resources (MDNR) produced a total harvest estimate of 450,122 fish (Table 1) for Michigan's 2000 Lake Erie sport fishery (non-charter). Estimated angler effort in 2000 increased again slightly to reach the highest level since 1994 (Figure 1). The walleye catch rate also increased in 2000, but the yellow perch catch rate declined (Figure 2). Trends in angler effort and catch rates for walleye and yellow perch since the mid-1980's suggest that the level of angler effort on Lake Erie is affected by many factors in addition to catch rates. Other factors, including weather, abundance of prey fish species, fishing success on other Great Lakes waters, and regional economic conditions have likely contributed to the comparatively low level of fishing effort since 1991.

Biological data were collected from walleye and yellow perch during the 2000 on-site creel survey. Age 2, 3, and 4 fish (1998, 1997 and 1996 year classes) dominated the walleye harvest, comprising 87% of the catch (Figure 3). Harvested age 2, 3, and 4 walleye averaged 363 mm



(14.3 in.), 430 mm (16.9 in.), and 470 mm (18.5 in.) in total length. The contribution from the 1995 walleye year class (age 5) was considerably lower at 5% of the catch.

Yellow perch harvest was dominated by age 4 fish (1996 year-class), which accounted for 42% of the total harvest (Figure 3). In combination, age 2 (14%), 3 (18%), and 5 (20%) contributed 52% of the total harvest. Average lengths of harvested age 2, 3, and 4 yellow perch were 185 mm (7.3 in.), 195 mm (7.7 in.), and 212 mm (8.3 in.), respectively. The observed mean length at age for yellow perch taken in the Michigan sport fishery in 2000 remained below the levels of the mid-1990's, but similar to those of the early 1990's (Figure 4). We suspect that increased abundance in recent years has resulted in slower growth for perch in western Lake Erie.

Since 1989, Michigan charter boat operators have been required to report their charter fishing catch and effort to the MDNR. In 2000, Michigan charter boat anglers harvested 88,762 fish from Lake Erie (Table 2). Walleye (53%) and yellow perch (45%) were the major species harvested, accounting for 98% of the catch. Charter boat walleye catch rates were nearly three times higher than those estimated for non-charter anglers in 2000, while yellow perch charter catch rates were about twice as high as the non-charter angler catch rate.

On Lake St. Clair and the St. Clair River, charter boat anglers harvested 9,488 fish (Table 3). Yellow perch (49%), "other" species (44%), and walleye (7%) made up the bulk of the catch, accounting for about 99% of the total harvest. The "other" species category is thought to consist mainly of smallmouth bass and muskellunge.

During the period since 1990, walleye catch rates have remained relatively high for Lake Erie charter boat anglers (Figure 5), but declined markedly after 1990 for Lake St. Clair charters (Figure 6). In 2000, the charter catch rate for Lake Erie walleye remained consistent with levels typical of the 1990's. The Lake St. Clair walleye catch rate declined in 2000, to the lowest level recorded since the mandatory reporting system went into effect in 1989. The cause of the decline in 2000, after a period of 6 years of relative stability has yet to be determined. However, the lower number of reported charter excursions on Lake St. Clair in 2000, and increased charter excursions on Lake Erie in 2000, may reflect a shift of charter fishing business due to better charter walleye fishing success on Lake Erie (Figure 7).

Charter boat catch rates for yellow perch have remained fairly steady for Lake Erie since 1996, but declined sharply in 1998 and remained low in 2000 for Lake St. Clair (Figures 5 and 6). Strangely, non-charter angler reports for yellow perch fishing during the summers of 1998, 1999, and 2000 on Lake St. Clair, indicated fishing was very good. Discussions with several Lake St. Clair charter boat captains indicate that the yellow perch charter boat fishery occurs mainly in September and early October. However, charter boat captains found that due to unseasonably warm weather, the fishery was very late to develop in 1998, 1999, and 2000, with the best fishing occurring in late October and November, after most charter businesses had closed for the season.

Despite the lack of creel survey data for Lake St. Clair, it is apparent that the muskellunge fishery exceeds that of any other period in modern history. Angler reports indicate spectacular catch rates in the 1990's. Muskellunge catch rates derived from the Angler Diary Program on Lake St. Clair verify these reports (Figure 8). We believe the quality of the Lake St. Clair muskellunge fishery is also reflected in the MDNR's Master Angler Program. The total number of muskellunge from Lake St. Clair entered for Master Angler Awards in 2000 was the highest since at least 1986 (Figure 9). In fact, 81 of the 94 total Great Lakes muskellunge entries for 2000 were from Lake St. Clair. The number of fish over 30 pounds was well above the numbers recorded prior to 1992. We believe that factors contributing to the dramatic improvement in this fishery include: 1) a positive response to increased minimum size limits on both sides of the lake since the mid-1980's; 2) physical and biological changes in the lake such as clearer water and increased aquatic plant growth resulting in improved habitat for Great Lakes muskellunge; and, 3) increased voluntary catch and release fishing for muskies in Lake St. Clair by both sport and charter anglers.



The Master Angler program also indicates that Lake St. Clair is the premier waterbody in the state for trophy smallmouth bass. Lake St. Clair accounted for 30% of all smallmouth bass entries in 2000 (catch/keep and catch/release programs combined). This strong representation of Lake St. Clair smallmouth bass in the statewide Master Angler Program is likely a reflection of the abundance of trophy-size smallmouth bass in the lake and a relatively high degree of angler effort targeting the species.

Commercial Fishery Summary

In 2000, only one Michigan commercial fishing license was active on Lake Erie. This state licensed commercial seine operation in the shallow embayments along Michigan's Lake Erie shoreline harvested 8 species of fish for a total of 366,656 pounds (Table 4). In combination, common carp (85%), buffalo (8%) and channel catfish (4%) accounted for 97% of the total harvest by weight. The total value of the 2000 Lake Erie commercial harvest from Michigan waters was estimated at \$65,445.

Summary of Netting Surveys

The Michigan waters of the western basin of Lake Erie have been monitored with spring trap net surveys since 1978. In 2000, total catch per net lift (CPUE) for all species combined was below the long-term mean, but well above the average for the 1990's (Table 5). Smallmouth bass, white bass, white perch, redhorse suckers, and common carp exhibited CPUE values above the 23 year mean CPUE. The walleye CPUE increased for the third consecutive year, closely approaching the long-term mean. Smallmouth bass catch rates have been relatively high since 1994. This is likely an indication of increased abundance since the mid-90's, probably a result of improving habitat conditions for smallmouth bass in Michigan's waters of Lake Erie. Yellow perch CPUE in 2000 declined from 1999, but remained above the mean for the 1990-99 time period. However, comparison of yellow perch mean CPUE for the 1978-89 period (254.6/lift) with the 1990-99 period (41.5/lift) clearly illustrates the dramatic change in yellow perch catches at the spring trap net sites. This change is likely the result of a substantial decline in yellow perch abundance since 1990. In addition, we also suspect increased net avoidance due to improved water clarity has contributed to low total CPUE since 1990.

Age 4 walleye (1996 year class) accounted for 35% of the trap net walleye catch in 2000 (Figure 10). The 1997 and 1994 year classes were also well represented, accounting for 27% and 8% of the total catch respectively. Conversely, the weak 1995 (age 5) year class was very poorly represented in the trap net catch in 2000. Based on mean length at age, no trend is evident for Lake Erie walleye growth rates. A total of 2,082 walleye captured in the trap nets were tagged and released as part of the ongoing interagency tagging project.

In 2000, age 4 (1996 year class) was the most abundant year class in the trap net yellow perch catch, accounting for 34% of the total catch (Figure 11). The 1995 and 1994 year classes (age 5 and age 6, respectively) were also well represented, contributing 49% of the total catch. Age specific catch rates for yellow perch from the trap nets, indicate that these three year classes (1994, 1995, and 1996) are the strongest yellow perch year classes since the late 1980's. Growth for yellow perch of most ages has apparently slowed again, after a period of several years in the early and mid-1990's of faster growth rates (Figure 12). This most recent slow down may be a result of increased yellow perch abundance and competition for food resources.

Since 1978, the MDNR has fished variable mesh multi-filament gill nets at two locations in western Lake Erie each fall, as part of the interagency yearling walleye assessment program. During 2000,



a total of 492 walleye were caught in four net lifts. The total walleye catch-per-effort for the index sites increased in 2000, but remained slightly below the mean annual cpue of 127.4 for the time series (Table 6). The age 1 catch rate of 57.0 suggests that the 1999 year class is above average. The very low catch rates for the 1995 and 1992 year classes across all survey years, illustrate the weakness of those two cohorts. No trend in walleye growth is obvious from the mean length at age data for walleye taken in the fall index gill net survey.

The fish community of Lake St. Clair was surveyed with bottom trawls in 2000 by the MDNR. Over 200 trawl tows were conducted at locations randomly selected across the lake. The diversity of the Lake St. Clair fish community was obvious during the sampling, with 42 fish species represented among the total of 51,968 fish collected. The most abundant species were spottail shiner, mimic shiner, yellow perch, trout-perch, rock bass, white perch, and round goby (Figure 13). Abundant forage species provide a healthy forage base for the lake's predator populations, including smallmouth bass, walleye, northern pike, and muskellunge. For example, Lake St. Clair walleye stomachs examined in 1999 contained mayflies and at least six different species of forage fish (Figure 14). Interestingly, the exotic round goby, which is now abundant throughout the lake, was found in 30% of the non-empty walleye stomachs. While the impact of the round goby on the native fish community of the lake is unclear at this time, the densities of johnny darter and logperch have greatly declined since 1996 (Figure 15). This decline could be a result of competitive interactions with the exotic round goby. At present, the exotic tubenose goby remains uncommon, and no ruffe have been collected from Lake St. Clair.

A total of 233 lake sturgeon were collected during assessment surveys on the St. Clair River and Lake St. Clair in 2000. Sturgeon captured averaged 50.4 inches in total length, with a range from 29 inches to 74 inches. A total of 225 sturgeon were aged with pectoral fin ray sections. Forty year-classes were represented with ages ranging from 6 to 74 years. Combined age samples from 1997-2000 indicate that survival of lake sturgeon spawned in the 1970's and 1980's has been consistent and higher than that of the 1960's (Figure 16). This may be a result of improved water quality after the Clean Water Act of 1972 or could be related to more restrictive lake sturgeon sport fishing regulations implemented in 1983. A total of 224 sturgeon were tagged on the dorsal fin with numbered metal tags and released.

Fish Tagging Studies

In 2000, a total of 6,241 walleye were tagged (610 reward and 5,631 non-reward tags) by Ontario, Ohio, Pennsylvania, New York and Michigan at 8 Lake Erie sites. A total of 130 non-reward tags were recovered by fishermen for a single season reporting rate of 2.3%. The 2000 site-specific reporting rate varied from a high of 4.6% at the Grand River site in Ohio, to a low of 1.2% for the Sandusky Bay tag site in Ohio. The interagency tagging study continues to provide evidence of substantial movement of walleye from spawning locations in Lake Erie through the St. Clair connecting waters (Figure 17).

A total of 904 lake sturgeon have been tagged and released on the St. Clair River and Lake St. Clair since 1996. To date, twenty-five tagged lake sturgeon have been recaptured. Twenty-two were originally caught with setlines, tagged, and released in the North Channel of the St. Clair River. Eleven have been recovered with survey setlines in the North Channel. Seven recoveries were reported in 1998 and 1999 by sport anglers in the North Channel. Five recoveries have been reported from the Ontario commercial trap net fishery in southern Lake Huron, approximately 70 kilometers from the tag site. All other recaptures have occurred within 10 km of the tag sites. Although trawling has accounted for 58% of the sturgeon tagged and released during this study, only three recoveries, 21% of the total, have been from a fish originally caught in a trawl on Lake St. Clair. This may be an indication that fish residing year round in the St. Clair River, or moving north into southern Lake Huron, experience a much higher level of fishing exploitation.



Water Levels

After nearly 30 years of above average water levels, anglers and boaters have experienced below average water levels in the connecting waters and Lake Erie during the last two years. Lower water levels may prove an impediment to sport anglers by restricting boat launching and boat travel to some traditional fishing areas. The effect of lower water levels on fish populations is uncertain. Short-term impacts may be negative. For example, northern pike spawning may be negatively impacted because coastal wetlands are dewatered. Bass spawning beds could also be more visible and more vulnerable to "preseason" catch and release bass fishing. However, if water levels remain low for 3-10 years, coastal wetlands would be expected to expand. If water levels then return to average or above average, increased coastal wetland habitat would positively impact many of the fish species in the connecting waters.

Sport Fishing Regulations

A special walleye size limit (only 1 fish over 18 inch total length; 6 fish daily limit) for the Ontario portion of Lake St. Clair and the St. Clair River remains in effect. This special regulation is designed to protect the Thames River walleye spawning stock. The Thames River is the major walleye spawning site for Lake St. Clair. The Michigan DNR did not recommend or implement this regulation for the Michigan portion of these water bodies. We believe the extensive movements of walleye throughout this system, combined with an absence of evidence for excessive exploitation, preclude such a radical regulation change. Michigan will continue to enforce a 13 inch minimum size limit for these waters.

Walleye in Lake Erie are managed cooperatively with other jurisdictions under a harvest quota system. Reduced spawning success for walleye in Lake Erie has resulted in lower adult walleye abundance in recent years. Consequently, walleye harvest quotas will be lower for several years. Therefore, the daily walleye bag limit in Michigan's waters of Lake Erie will be reduced to a 5 fish daily limit with 1 additional fish, for a total daily limit of 6 fish per day for 2001. This results in consistent Michigan walleye size and daily bag limits for the connecting waters and Lake Erie. If the Michigan walleye sport harvest exceeds the harvest quota in the future, the daily bag limit will be adjusted.

Lake sturgeon fishing regulations were revised by the MDNR in 1999. Effective, April 1, 1999, harvest of lake sturgeon is prohibited from Michigan's Great Lakes and connecting waters, except for the St. Clair River and Lake St. Clair. On the St. Clair River and Lake St. Clair, regulations include a "slot" size limit, with a minimum length limit of 1,067 mm (42 inches) and a maximum length limit of 1,270 mm (50 inches), a season bag limit of 1 fish, an open season from July 16 to September 30, and mandatory registration of harvested sturgeon at designated check stations. This "slot" limit will allow a limited harvest to continue, while protecting sexually mature female fish, and potentially allowing older fish to increase in abundance. No lake sturgeon were registered at the check stations during the 1999 or 2000 harvest seasons.

The open season for smallmouth bass fishing on the connecting waters (St. Clair River, Lake St. Clair, and Detroit River) is from the last Saturday in June to December 31. In recent years, "preseason" fishing for bass has become increasingly popular on these waters. Many anglers are apparently unaware that it is a violation of the Natural Resources and Environmental Protection Act to fish for smallmouth bass during the closed season (Public Act 451 of 1994, Part 487, Sec. 324.48716), even if the angler intends to release any bass caught. The objective of the season closure is to protect bass during the pre-spawning and spawning periods when they are particularly vulnerable to overexploitation. In 2001, low water levels may make spawning bass more visible and thus more vulnerable in Lake St. Clair. We urge bass anglers to show restraint and comply with the existing fishing regulations on the connecting waters.



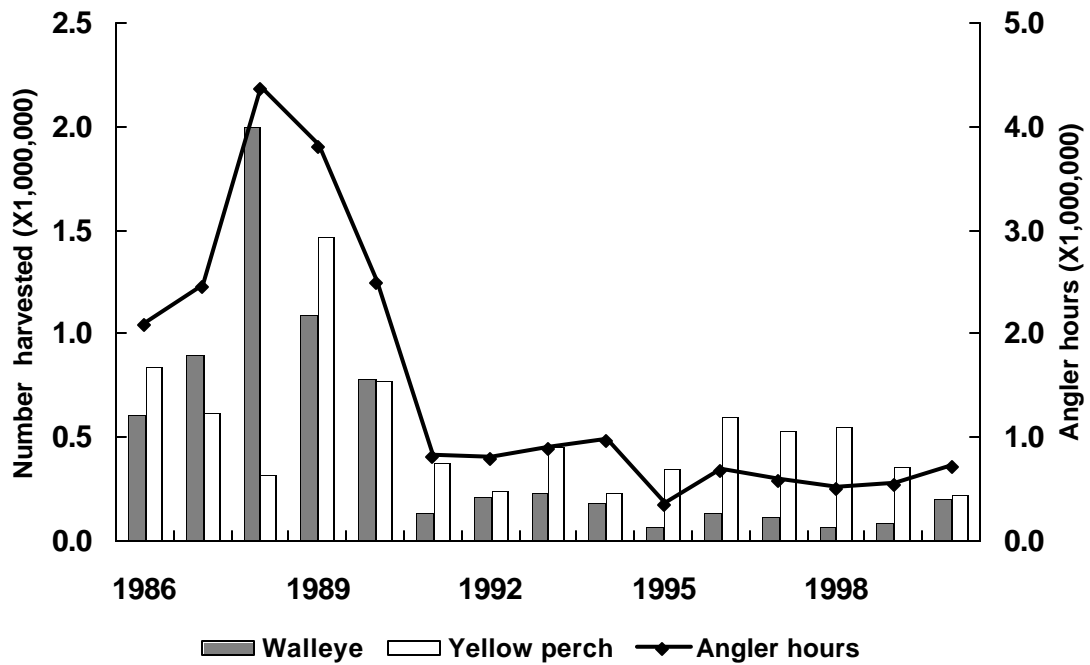


Figure 1.—Estimated harvest and effort for Michigan's Lake Erie sport fishery, 1986-2000.

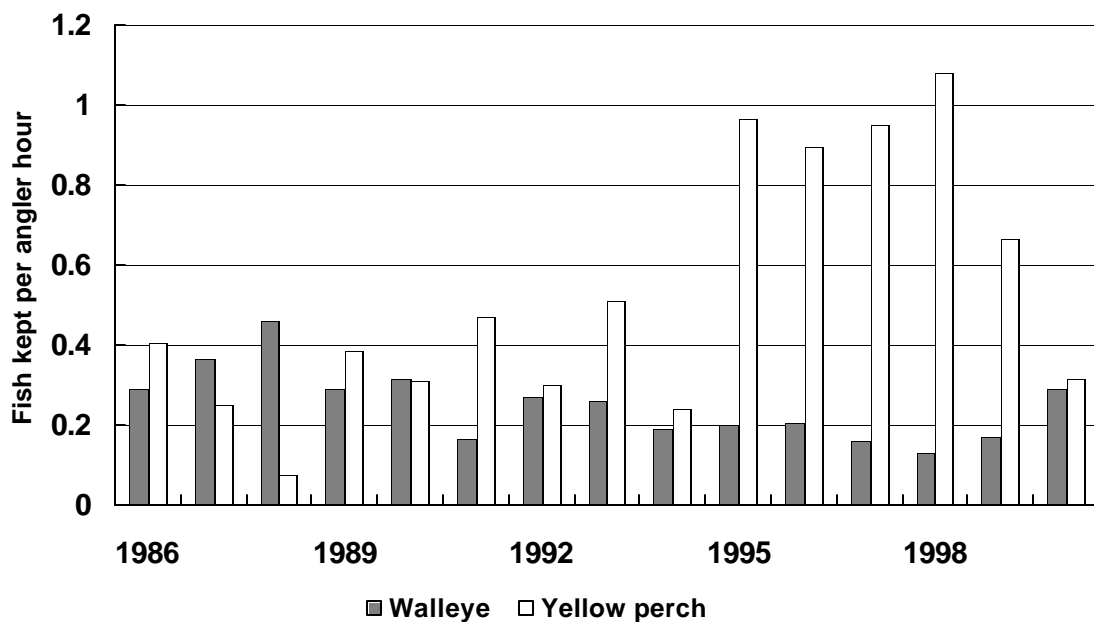
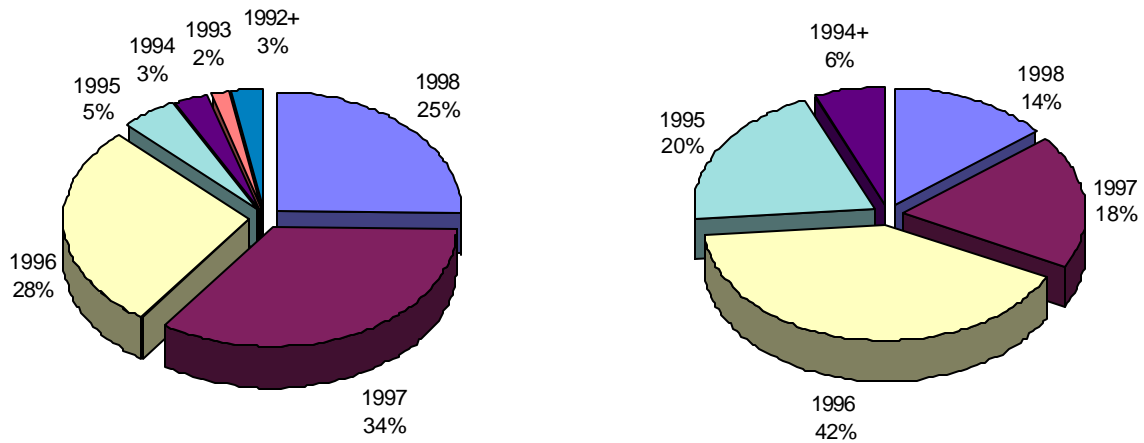


Figure 2.—Walleye and yellow perch catch per effort for Michigan's Lake Erie sport fishery, 1986-2000.



Walleye

Yellow Perch

Figure 3. —Year-class contribution to Michigan sport harvest for walleye and yellow perch from Lake Erie in 2000.

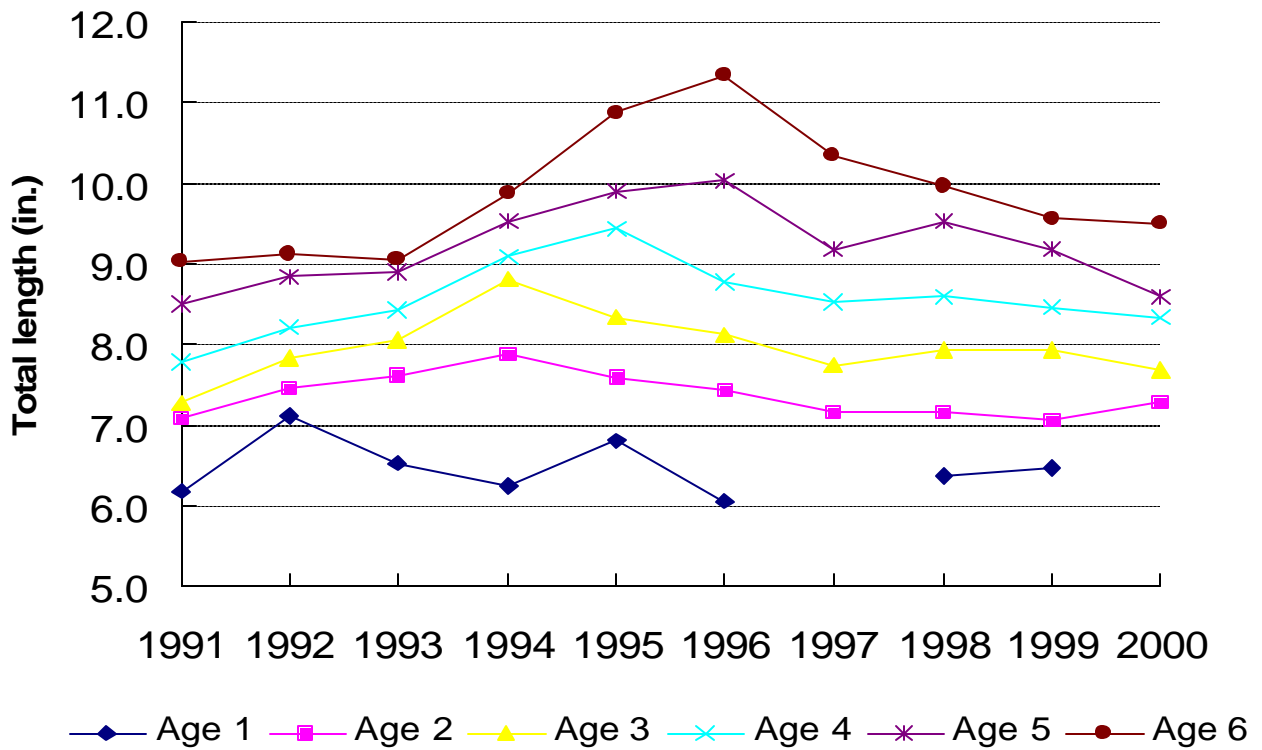


Figure 4. —Mean length at age for sport caught yellow perch from Michigan's waters of Lake Erie, 1991-2000.

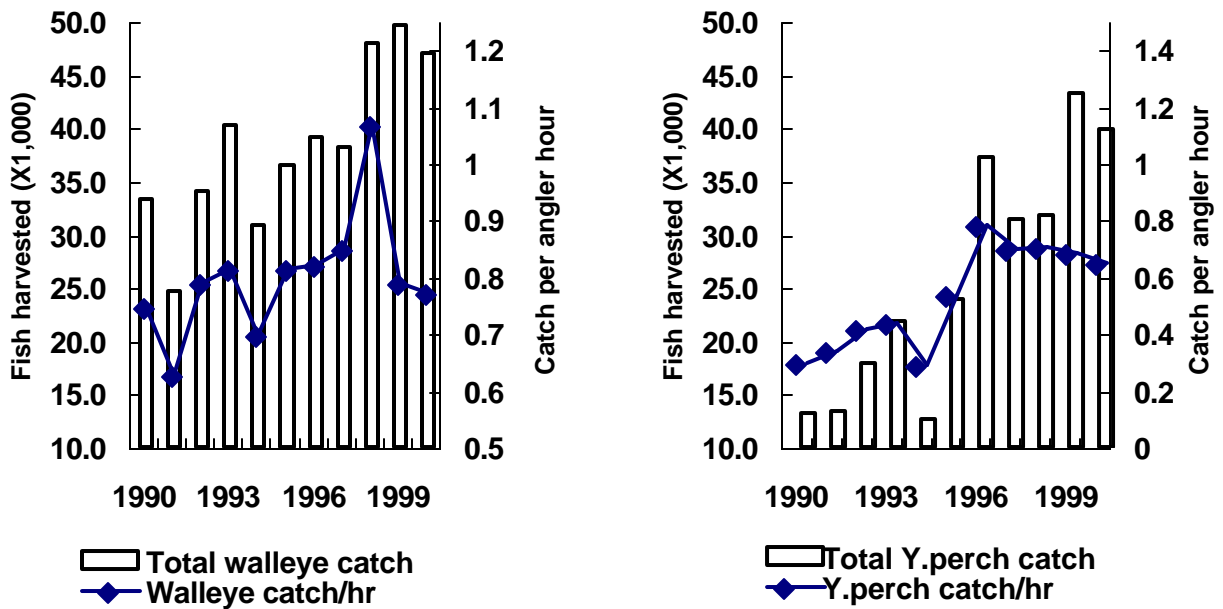


Figure 5. —Michigan charter boat harvest and catch rates for Lake Erie, 1990-2000.

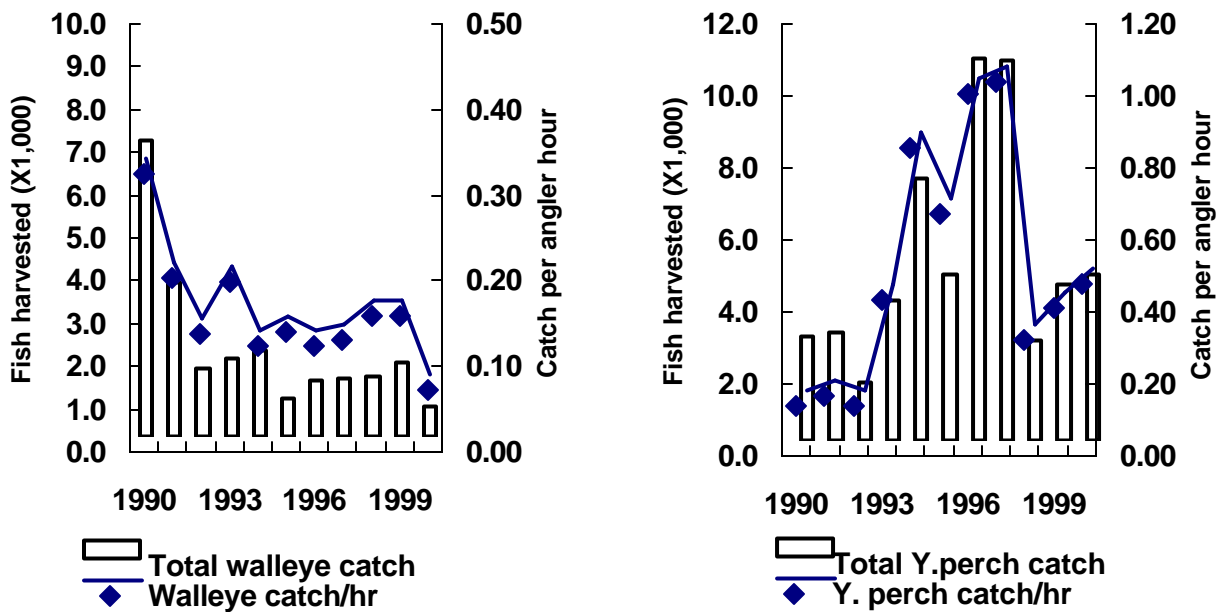


Figure 6. —Michigan charter boat harvest and catch rates for Lake St. Clair, 1990-2000.

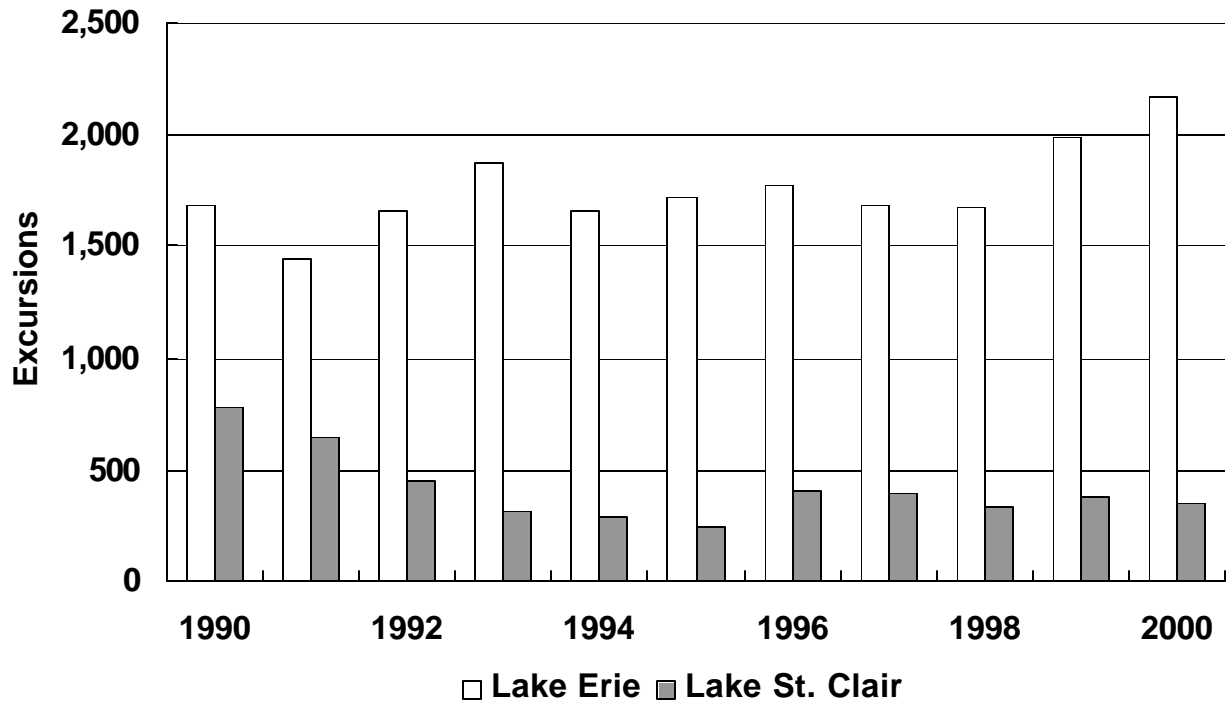


Figure 7. —Reported charter boat excursions on Lake Erie and Lake St. Clair, 1990-2000.

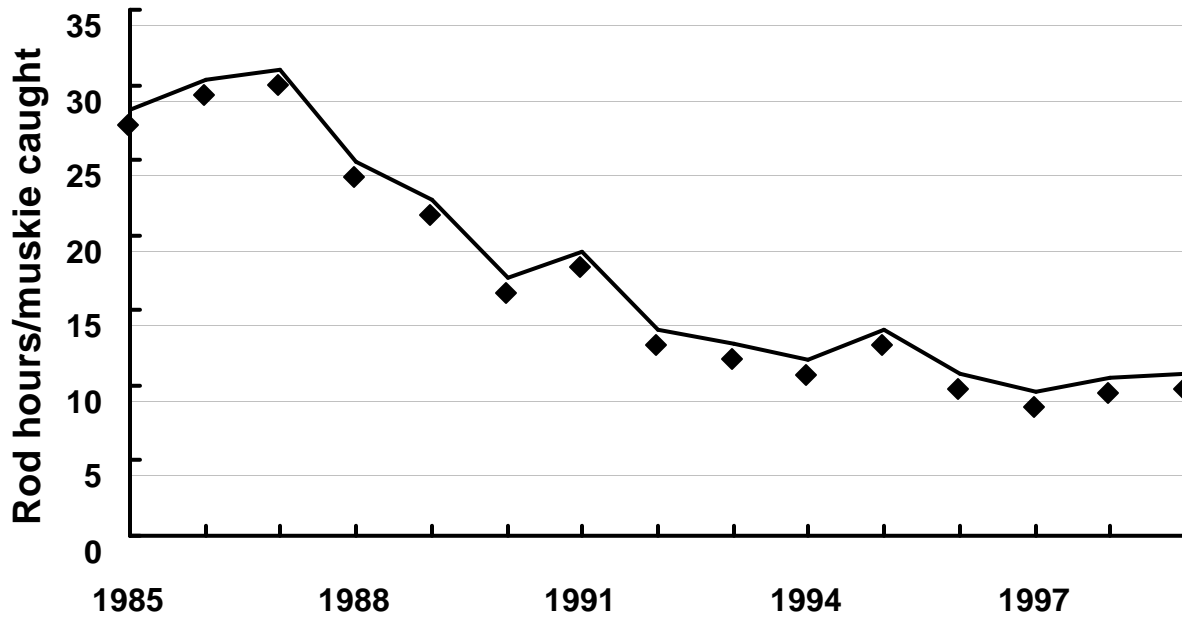


Figure 8. —Lake St. Clair great lakes muskellunge catch rate from Angler Diary Program, 1985-99.

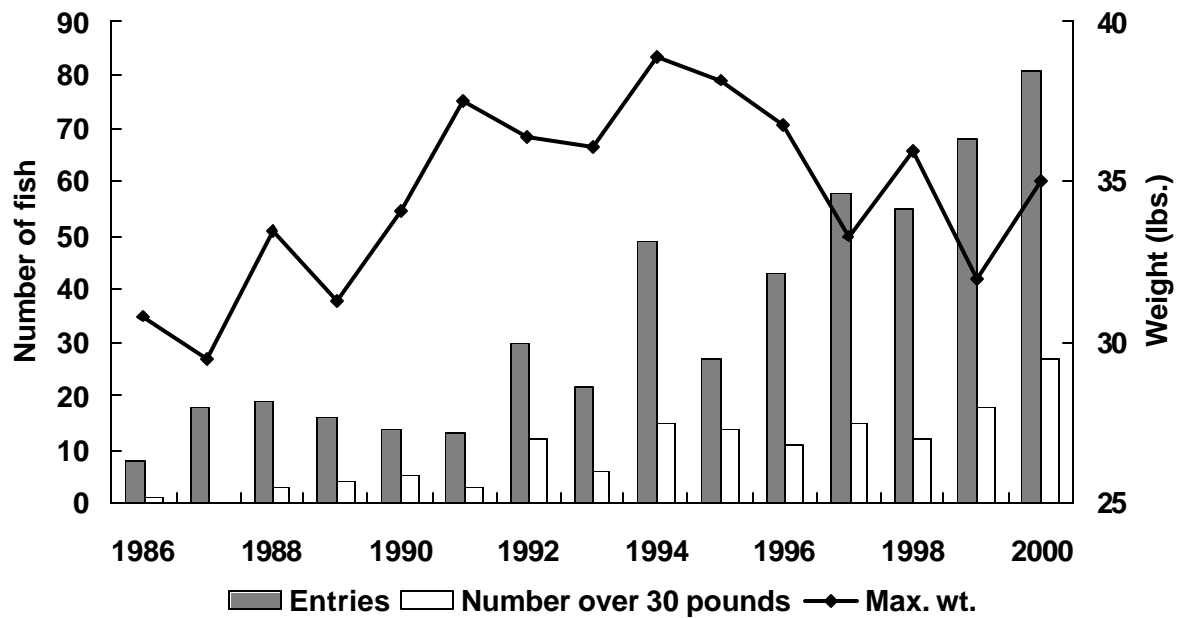


Figure 9. —Lake St. Clair great lakes muskellunge entered in the Michigan DNR Master Angler Program, 1986-2000. Values for 1992-2000 represent combined regular and catch-and-release Master Angler categories.

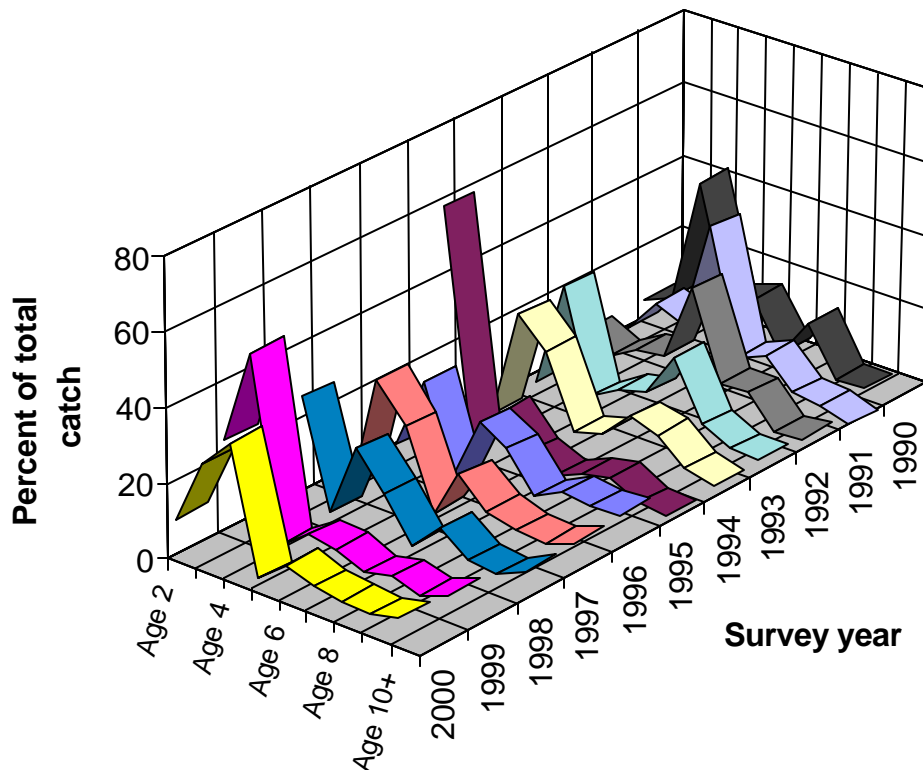


Figure 10. —Age composition of walleye from survey trap nets on Lake Erie, 1990-2000.

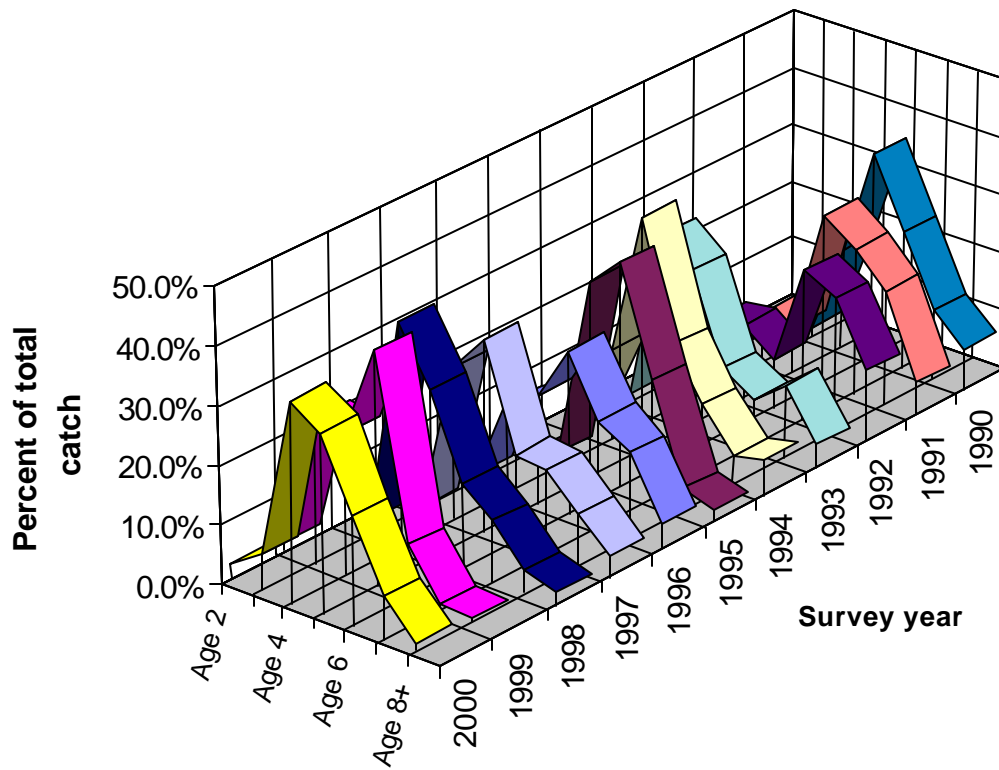


Figure 11. —Age composition of yellow perch from survey trap nets on Lake Erie, 1990-2000.

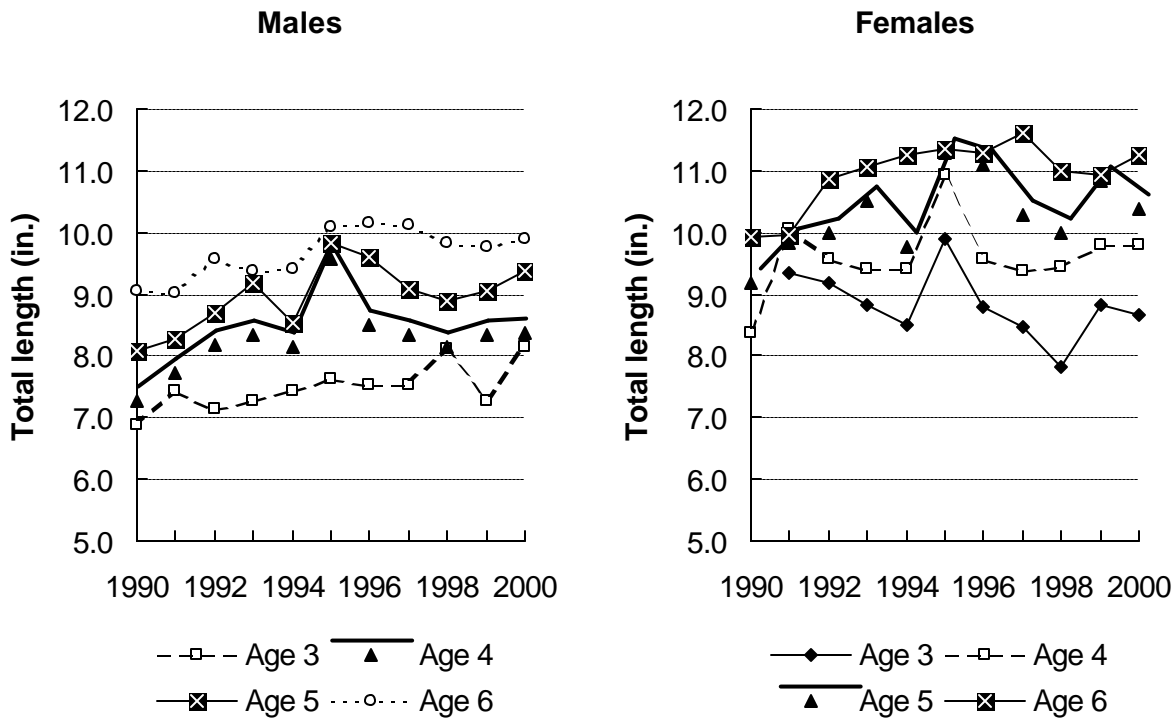


Figure 12. —Mean length-at-age for yellow perch from index trap nets, Lake Erie, 1990-2000.

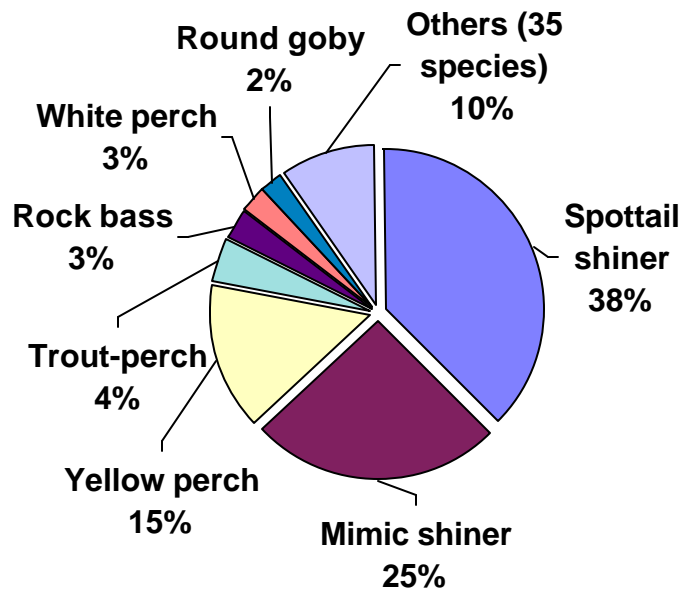


Figure 13. —Catch composition for all trawls on Lake St. Clair in 2000.

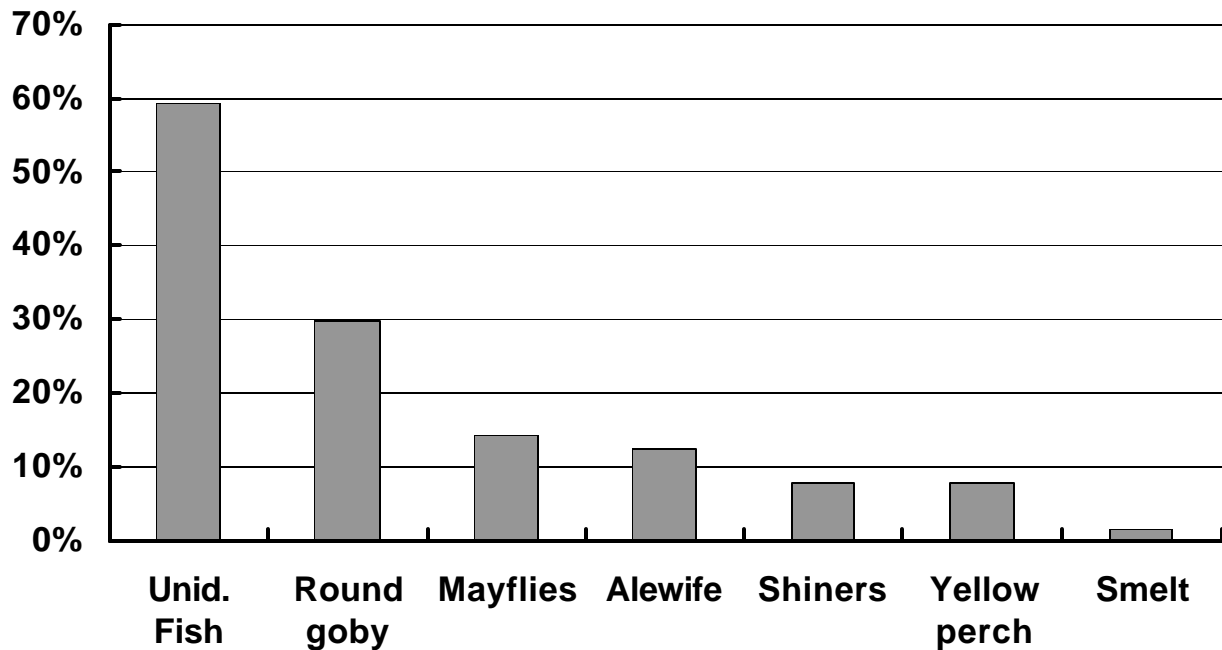


Figure 14. —Frequency of occurrence of various prey taxa in non-empty Lake St. Clair walleye stomachs examined in 1999 (n=64).

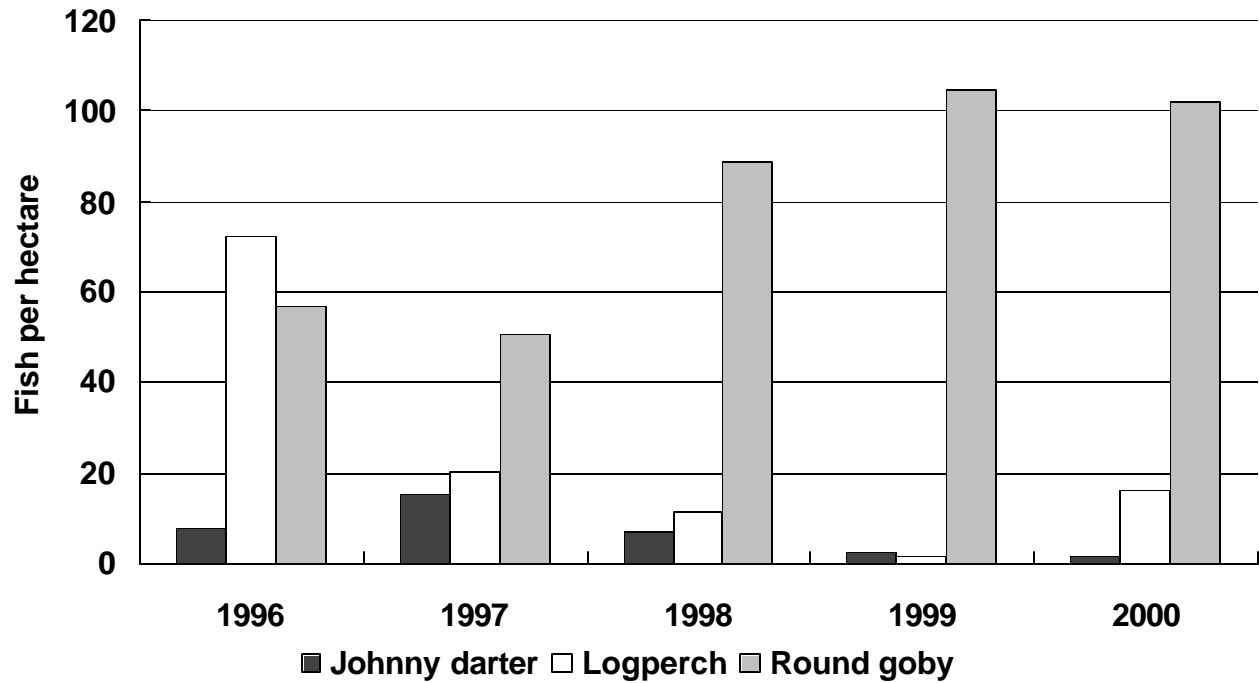


Figure 15. —Density of johnny darter, logperch, and round goby in Lake St. Clair, based on mean trawl catch rates for August trawls.

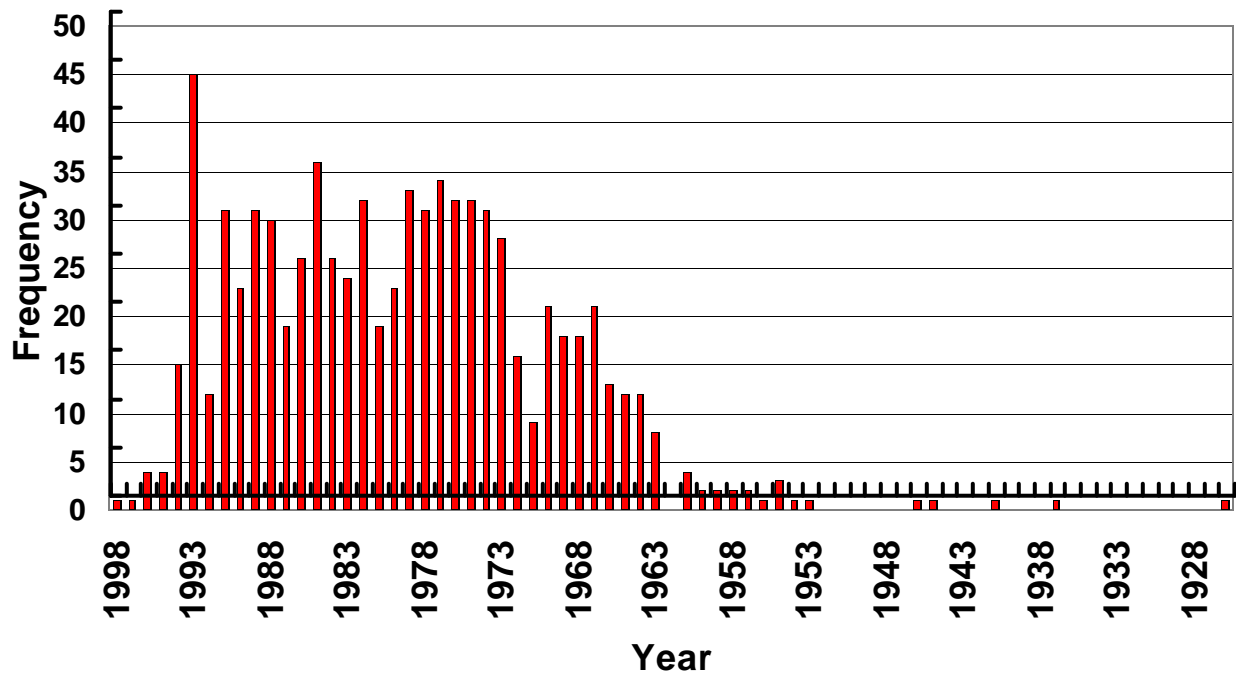


Figure 16.—Year of hatching for lake sturgeon sampled from Lake St. Clair and St. Clair River from 1997 to 2000 by Mt. Clemens Research Station.

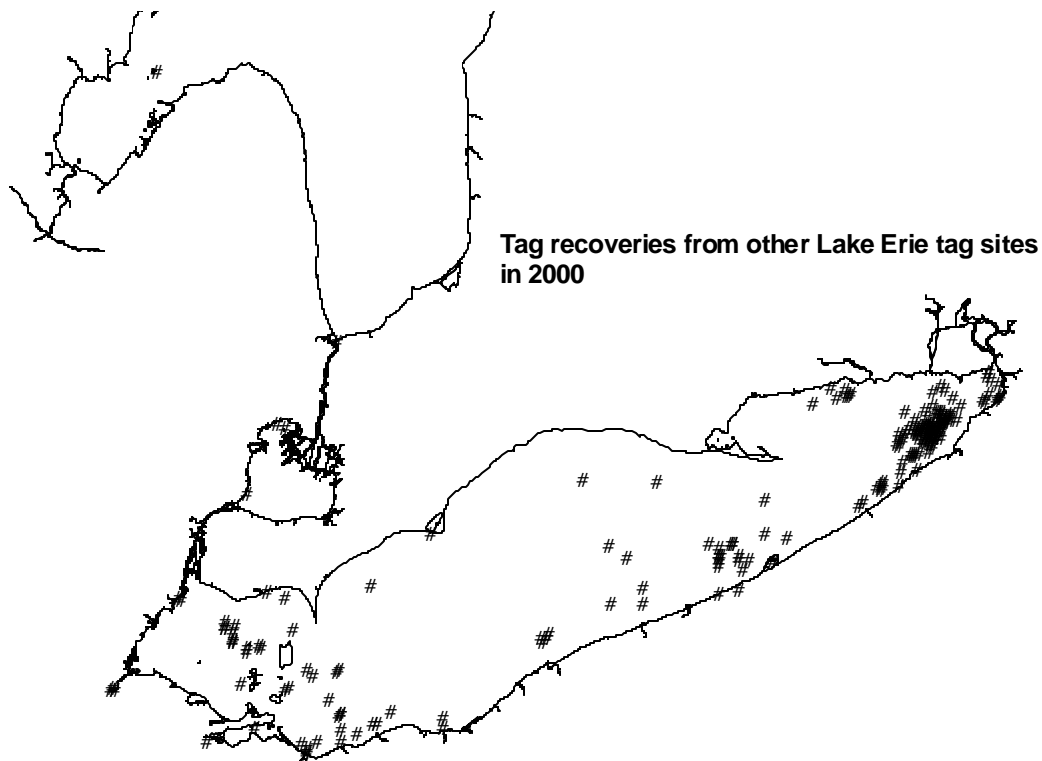
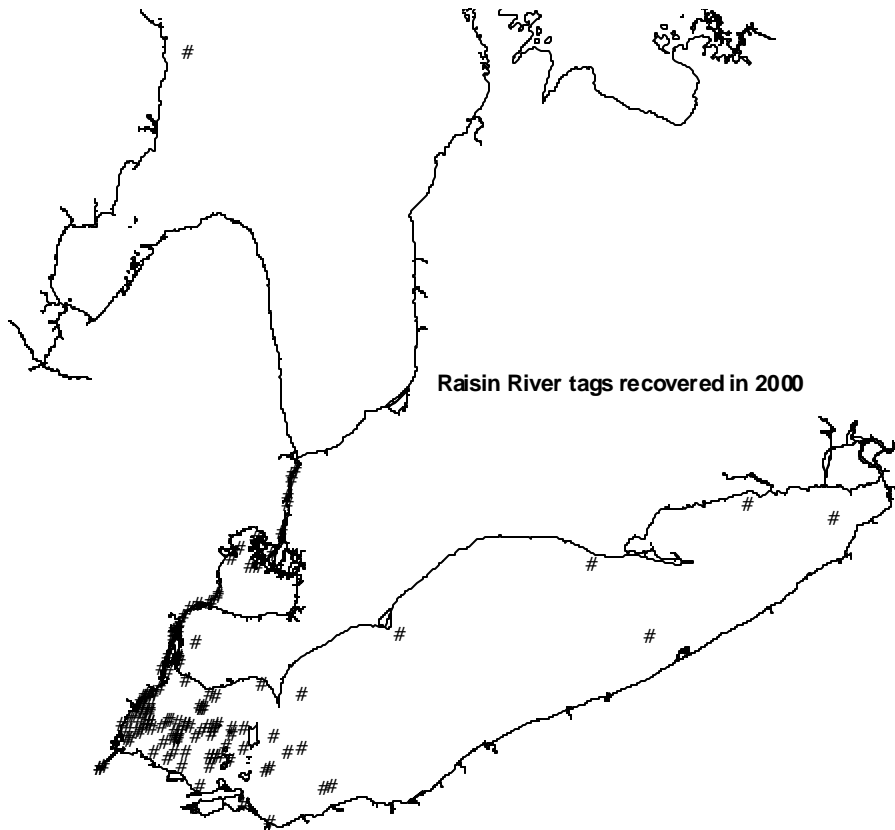


Figure 17. —Geographical distribution of walleye tag recoveries in 2000 from fish tagged during all years at Monroe (131 recoveries in 2000) and other Lake Erie tag sites (197 recoveries in 2000).

Table 1. —Estimated sport harvest, catch rate, and effort for Michigan's 2000 Lake Erie non-charter boat fishery. Two standard errors in parentheses.

Species	Harvest per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Yellow perch	0.3135 (0.5814)	985 (2,497)	8,724 (44,473)	26,152 (50,252)	17,396 (37,107)	72,944 (397,326)	53,749 (58,650)	43,505 (62,701)	223,455 (413,673)
Walleye	0.2879 (0.1115)	1,863 (10,147)	20,810 (16,537)	35,803 (37,027)	112,895 (56,303)	30,382 (29,131)	1,390 (2,141)	2,072 (7,043)	205,215 (76,291)
White bass	0.0094 (0.0142)	516 (1,474)	2,030 (4,662)	2,294 (8,122)	1,184 (3,198)	448 (937)	144 (1,105)	49 (417)	6,665 (10,118)
White perch	0.0076 (0.0150)	25 (100)	0 (0)	1,093 (5,597)	1,149 (3,858)	1,704 (7,563)	1,002 (2,768)	447 (1,746)	5,420 (10,683)
Channel catfish	0.0053 (0.0092)	25 (105)	36 (157)	856 (3,206)	1,824 (5,037)	511 (554)	159 (482)	365 (2,563)	3,776 (6,542)
Smallmouth bass	0.0031 (0.0064)	0 (0)	87 (666)	1,262 (3,973)	301 (1,231)	430 (1,376)	155 (901)	0 (0)	2,235 (4,523)
Freshwater drum	0.0029 (0.0083)	0 (0)	247 (1,462)	520 (3,692)	848 (4,242)	336 (550)	131 (935)	0 (0)	2,082 (5,911)
Bluegill	0.0013 (0.0074)	34 (167)	48 (361)	0 (0)	83 (602)	55 (12)	9 (72)	730 (5,190)	959 (5,240)
Rock bass	0.0002 (0.0021)	0 (0)	39 (1,441)	0 (0)	66 (480)	0 (0)	16 (106)	15 (104)	136 (1,526)
Rainbow trout	0.0001 (0.0008)	0 (0)	0 (0)	84 (585)	0 (0)	0 (0)	0 (0)	0 (0)	84 (585)
Largemouth bass	0.0001 (0.0007)	0 (0)	0 (0)	0 (0)	70 (499)	0 (0)	0 (0)	0 (0)	70 (499)
Other species	0.0000 (0.0001)	19 (72)	6 (45)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	25 (85)
Angler hours		16,956 (6,405)	86,422 (30,573)	178,041 (53,292)	208,986 (28,121)	144,720 (32,223)	47,359 (15,760)	30,258 (10,081)	712,742 (77,426)
Angler trips		3,225 (1,311)	15,603 (5,556)	33,180 (9,983)	35,324 (5,165)	25,700 (5,816)	9,808 (3,291)	5,928 (2,008)	128,768 (14,408)
Angler days		3,209 (1,308)	15,423 (5,470)	32,954 (9,937)	34,886 (5,124)	25,385 (5,743)	9,667 (3,237)	5,892 (2,001)	127,416 (14,286)



Table 2. —Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake Erie, 2000.

Species	Total catch per hour	Total catch per excursion	Month							
			Apr	May	Jun	Jul	Aug	Sep	Oct	Season
Coho salmon	0.000	0.001	0	0	0	0	0	0	0	0
Chinook salmon	0.000	0.001	0	0	0	0	0	0	0	0
Rainbow trout	0.001	0.029	0	0	6	8	50	0	0	64
Yellow perch	0.653	18.317	0	445	763	420	11,927	19,295	7,008	39,858
Walleye	0.771	21.630	249	3,557	20,054	18,868	3720	618	0	47,066
Other	0.029	0.815	82	397	842	353	68	31	0	1,773
Angler hours			522	6,275	26,491	16,278	5,685	4,333	1,450	61,034
Angler trips			53	1,071	4,537	2,856	1,063	839	291	10,710
Anglers										
Resident			35	883	3,970	2,492	980	801	277	9,438
Nonresident			18	188	567	364	83	38	14	1,272
Charter excursions			18	230	905	589	218	157	59	2,176

Table 3. —Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake St. Clair and the St. Clair River, 2000

Species	Total catch per hour	Total catch per excursion	Month							
			Apr	May	Jun	Jul	Aug	Sep	Oct	Season
Coho salmon	0.000	0.000	0	0	0	0	0	0	0	0
Chinook salmon	0.000	0.004	0	0	0	0	0	1	0	1
Yellow perch	0.483	13.247	0	138	1,362	684	790	735	901	4,610
Walleye	0.072	1.977	0	60	134	306	154	34	0	688
Other	0.439	12.037	0	167	789	1,338	1,166	634	95	4,189
Angler hours			0	449	1,909	2,713	2,328	1,464	675	9,537
Angler trips			0	107	320	437	354	220	95	1,533
Anglers										
Resident			0	107	312	400	335	217	88	1,459
Nonresident			0	0	8	37	19	6	7	77
Charter Excursions			0	20	76	99	82	50	21	348

Table 4. —Commercial harvest from Michigan waters of Lake Erie in 2000.

	Carp	Buffalo	Channel catfish	White Bass	Goldfish	Others ¹	Total
Harvest (lbs.)	313,200	27,843	14,400	1,776	3,025	6,412	366,656
% of total	85	8	4	>1	1	1	100
Economic value	\$38,956	\$13,689	\$9,041	\$1,421	\$1,068	\$1,271	\$65,445

¹ 'Others' category includes gizzard shad, bullhead, and white perch

Table 5. —Mean catch per trap net lift for all species commonly taken during spring trap net surveys in Michigan waters of Lake Erie.

Species	Survey year											
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Walleye	28.1	49.0	18.1	20.6	38.8	26.1	36.6	75.5	61.7	33.9	83.1	35.9
Smallmouth bass	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.3
Yellow perch	377.0	320.0	669.0	512.0	146.0	257.0	129.0	156.0	40.3	174.0	22.9	251.5
Rock bass	1.2	0.8	1.9	0.9	1.5	1.3	1.0	1.5	0.7	1.5	0.9	0.8
White bass	1.5	1.5	3.7	1.4	10.5	4.9	2.5	2.8	7.6	0.4	5.3	4.7
White perch	0.0	0.1	0.3	0.5	24.6	35.0	10.9	38.9	30.3	43.5	63.1	233.0
Pumpkinseed	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1
Bluegill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Black crappie	0.2	0.0	0.2	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.4	0.2
Channel catfish	3.5	9.7	5.4	5.8	4.9	10.6	4.6	5.5	5.4	2.7	3.5	4.1
Brown bullhead	0.2	1.1	1.6	1.9	1.7	4.2	2.5	1.5	4.1	0.9	9.2	3.9
White sucker	7.8	8.3	7.9	12.2	8.7	6.7	10.2	33.0	10.2	7.0	6.7	2.8
Redhorse sp.	2.4	1.2	0.6	1.0	0.8	1.5	1.7	1.4	1.3	1.7	1.8	0.6
Freshwater drum	37.4	66.8	14.0	42.9	13.4	23.5	25.1	30.6	25.3	9.1	15.6	6.4
Common carp	5.1	26.1	4.7	8.2	6.9	14.9	3.5	2.0	1.9	0.6	6.0	0.6
Goldfish	4.8	2.4	0.3	0.4	0.4	2.5	0.6	0.2	0.1	0.0	0.2	0.1
Gizzard shad	4.4	4.7	2.3	3.9	17.8	28.4	18.1	17.4	2.7	2.3	15.9	0.3
Longnose gar	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Bowfin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Quillback	4.0	18.6	1.8	2.0	2.4	5.6	2.0	1.9	1.7	1.8	1.5	0.7
Stonecat	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Total	477.9	510.3	731.8	613.9	278.8	422.4	248.7	368.5	193.6	279.7	236.4	546.2
% yellow perch	78.9	62.7	91.4	83.4	52.4	60.8	51.9	42.3	20.8	62.2	9.7	46.0
% white perch	0.0	0.0	0.0	0.1	8.8	8.3	4.4	10.6	15.7	15.6	26.7	42.7
Net lifts	50	46	48	36	37	53	57	51	49	55	51	55

Table 5. —Continued.

Species	Survey year										78-89 Mean	90-99 Mean	78-00 Mean
	1991	1992	1993	1994	1995 ¹	1996	1997	1998	1999	2000			
Walleye	95.9	37.7	39.2	53.0	26.2	52.0	30.2	34.8	38.0	41.4	42.3	43.1	42.6
Smallmouth bass	0.2	0.1	0.2	0.8	2.2	2.1	1.2	1.9	1.9	2.2	0.1	1.1	0.6
Yellow perch	94.6	35.0	50.2	23.2	10.3	36.6	30.7	33.3	61.0	50.1	254.6	41.5	153.0
Rock bass	0.8	0.5	1.2	1.0	4.1	1.1	0.9	1.0	2.8	0.7	1.2	1.4	1.2
White bass	1.6	0.5	0.1	1.1	2.1	0.6	2.6	1.3	4.6	4.0	3.9	1.5	2.9
White perch	56.8	5.1	0.0	14.7	72.8	5.9	10.2	8.7	79.4	54.7	40.0	29.4	36.0
Pumpkinseed	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Bluegill	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Black crappie	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1
Channel catfish	6.0	4.6	4.6	5.4	3.7	8.8	4.4	11.4	16.0	5.2	5.5	7.4	6.3
Brown bullhead	4.3	4.0	1.6	1.1	0.2	1.1	0.4	0.0	1.0	2.9	2.7	2.7	2.7
White sucker	13.5	14.6	9.0	5.8	7.4	14.0	4.7	15.0	6.0	5.8	10.1	9.4	9.6
Redhorse sp.	0.6	3.1	3.6	1.8	1.0	5.5	1.9	3.3	2.2	3.8	1.3	2.3	1.9
Freshwater drum	25.6	8.9	20.7	8.8	13.0	15.4	6.8	28.3	50.4	11.3	25.8	18.3	21.9
Common carp	2.3	1.3	1.4	3.7	2.9	8.2	0.6	3.1	8.0	12.2	6.7	3.4	5.5
Goldfish	0.1	0.1	0.0	4.4	0.1	0.5	0.1	0.0	0.1	0.0	1.0	0.5	0.8
Gizzard shad	0.0	0.6	0.3	0.3	1.7	0.3	0.0	0.0	0.2	2.4	9.9	0.6	5.5
Longnose gar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bowfin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Quillback	2.9	4.4	3.2	4.6	6.7	8.9	2.2	7.9	8.5	3.7	3.7	5.1	4.3
Stonecat	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	305.5	120.5	135.2	129.6	155.2	161.2	96.9	150.0	280.3	200.4	409.0	167.8	295.1
% yellow perch	31.0	29.0	37.1	17.9	6.2	22.7	31.7	22.2	21.8	25.0	55.2	24.8	40.7
% white perch	18.6	4.2	0.0	11.3	46.9	3.6	10.5	5.8	28.3	27.3	11.1	15.7	13.8
Net lifts	29	55	40	45	39	45	57	44	45	51	49	48	49

¹Sampling period delayed two weeks.

Table 6. —Walleye CPUE (number per net lift) in multi-filament gill nets during fall surveys on Michigan waters of Lake Erie.

Year class	Total CPUE	Survey year																	
		1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1973	1.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1974	13.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1975	42.8	0.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1976	18.4	0.3	0.0	0.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1977	171.0	2.5	3.0	0.5	0.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1978	61.6	2.5	1.8	0.5	1.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1979	72.4	4.3	2.3	2.0	0.5	0.5	0.3	—	—	—	—	—	—	—	—	—	—	—	—
1980	92.7	14.5	5.0	5.3	2.3	0.5	0.3	0.0	0.3	—	—	—	—	—	—	—	—	—	—
1981	72.3	21.3	7.8	3.8	2.8	2.3	0.5	0.3	0.0	—	—	—	—	—	—	—	—	—	—
1982	306.2	29.0	91.8	95.8	44.3	28.5	5.3	7.5	3.5	0.5	—	—	—	—	—	—	—	—	—
1983	34.6	—	4.5	12.0	4.0	5.0	3.5	1.8	1.8	2.0	—	—	—	—	—	—	—	—	—
1984	147.7	—	—	69.8	34.3	20.5	3.5	8.0	8.3	2.0	0.5	0.3	0.5	—	—	—	—	—	—
1985	177.2	—	—	—	98.0	42.5	9.3	14.3	8.5	1.5	1.3	0.8	1.0	—	—	—	—	—	—
1986	297.5	—	—	—	—	96.8	30.3	90.3	43.5	19.5	11.0	3.8	2.0	0.3	—	—	—	—	—
1987	127.8	—	—	—	—	—	4.5	53.8	26.8	20.0	13.8	2.5	3.8	1.0	0.5	0.8	—	0.3	—
1988	125.0	—	—	—	—	—	—	61.5	35.8	9.3	7.3	4.5	4.5	0.5	0.8	0.8	—	—	—
1989	52.6	—	—	—	—	—	—	—	16.0	17.0	10.0	2.8	3.3	1.3	0.8	0.8	0.3	0.3	—
1990	136.4	—	—	—	—	—	—	—	—	54.5	48.0	13.0	16.5	1.5	1.3	1.3	0.0	0.3	—
1991	194.3	—	—	—	—	—	—	—	—	—	63.0	47.3	61.5	11.3	6.8	2.8	1.3	0.3	—
1992	16.7	—	—	—	—	—	—	—	—	—	—	2.0	7.3	2.0	0.3	1.5	2.3	1.0	0.3
1993	169.2	—	—	—	—	—	—	—	—	—	—	—	73.3	71.0	11.8	8.08	3.3	1.5	0.3
1994	129.7	—	—	—	—	—	—	—	—	—	—	—	—	63.3	43.0	14.0	4.8	2.8	1.8
1995	7.2	—	—	—	—	—	—	—	—	—	—	—	—	—	3.3	1.3	0.8	1.0	0.8
1996	165.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	37.5	84.3	30.5	13.3
1997	108.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	54.3	34.3	20.3
1998	55.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	26.0	29.5
1999	57.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	57.0
Total		74.9	116.2	190.2	187.8	196.6	57.5	237.5	144.5	126.3	154.9	77.0	173.7	152.2	68.6	68.8	151.4	98.3	123.3
Net lifts		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4